

In response to the rejections applicants provide the following amendments and distinguishing comments, which are believed to overcome the all of the rejections of record. Favorable reconsideration of all of the pending claims is respectfully requested.

Initially, applicants respectfully request that the docket number for the present case be changed to ACA 6252. Further, please change the correspondence address for the present case to:

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Concerning the rejection of claims 1, 2 and 10-12 under 35 U.S.C. § 112, second paragraph, the examiner alleges that use of the terms "about" and "range of from about" renders the claims indefinite. Applicants respectfully disagree. In this regard applicants refer to MPEP 2173.05(b) which states:

The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. 112, second paragraph. *Seattle Box Co., v. Industrial Crating and Packing, Inc.*, 731 F2d. 818, 221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification.

The examiner is also respectfully directed to Section A. of MPEP 2173.05(b) which clearly indicates that use of the term "about" does not automatically render the claim indefinite. In fact, use of such term is acceptable in cases where the range of specific activity is **clear from the specification**.

In the present case the term "about" is employed to convey the temperature range for alkylation. Applicants submit that this language is clear, but flexible

language and that one of ordinary skill in the art would clearly understand what is being claimed in view of the specification. See Ex parte Eastwood, 163 USPQ 316 (Bd. App. 1968). Therefore, contrary to the examiner's position, the pending claims are not believed to be indefinite; reconsideration and withdrawal of the subject rejection is therefore respectfully requested.

Concerning the rejection of claims 1-12 under 35 U.S.C. §103(a) over U.S. Patent 4,255,343 to Gosser et al. applicants provide the following distinguishing remarks.

Initially, Gosser, like the claimed invention, is based on the alkylation of aromatic hydrocarbons (including anthracene and o-xylene) via the **electrophilic addition** of a carbonium ion to the aromatic ring. The carbonium ion, in turn, is generated, by the reaction of an **acidic catalyst** (methanesulfonic acid) with an **olefin**.

The use of *olefin as alkylating agent and methanesulfonic acid as catalyst*, for the alkylation of aromatic hydrocarbons is not new. However, this is not deemed to render the claimed invention unpatentable for the following reasons.

Initially, Gosser discloses a process for preparing **2-t-alkylanthracene**, while the claimed invention is directed to a process of preparing **monoalkyl-o-xylene**. The 2-t-Alkylanthracene prepared by Gosser is utilized for the preparation of 2-t-alkylanthraquinone which, in turn, is needed for the production of hydrogen peroxide. The mono-alkyl-o-xylene prepared by the present invention is used as the intermediate for the preparation of sulfonate derivative which, in turn is used, as surfactant (and particularly, in metal working and enhanced oil recovery).

Further, the Gosser process utilizes a **poly-cyclic** aromatic hydrocarbon (more than one ring) and a **branched olefin** in order to prepare the 2-t-alkylanthracene. Additionally, Gosser clearly employs an excess of the starting

aromatic as well as dealkylation of the dialkylated compound in order to maximize the concentration of the monoalkyl aromatic product.

In contradistinction the claimed process utilizes a **mono-cyclic** aromatic hydrocarbon (one ring) and a **linear, alpha-(terminal) olefin**. Further, a near stoichiometric amount of starting aromatic is employed and **dealkylation is not utilized** in order to enhance the **monoalkylation**, i.e., the monoalkyl aromatic product is formed directly from the alkylation in the present process.

The effectiveness of the two processes is indicated by the ratio of the concentration (in wt %) of monoalkyl aromatic to the concentration of polyalkyl aromatic (Column "C" on the Table I of Gosser). The ratio for the Gosser process is 2.9:1. The ratio for the claimed process is at least ten times higher (> 30:1). The lower ratio indicative of the Gosser process indicates that it is a **typical Fredel-Crafts alkylation reaction** and thus cannot be viewed as a mono-alkylation process. The higher ratio given by our process confirms its uniqueness of being a **true mono-alkylation process**.

Finally, in the Gosser process, a large quantity of the starting aromatic (anthracene) as well as the olefin (from the dealkylation) remains unreacted. Thus, the costly fractionation distillation would be required to obtain his preferred monoalkyl aromatic with high purity. In the claimed process, the reaction is virtually complete, yielding the preferred monoalkyl aromatic with high purity. Thus, it could be used directly without requiring purification (via distillation). The catalyst could also be recycled (re-used) several times.

For the convenience of the examiner, applicants attach hereto a table which summarizes the numerous differences between Gosser and the claimed invention. Based on the differences between the claimed invention and Gosser, applicants respectfully submit that the claimed invention represents a patentable departure from the teachings of Gosser. Favorable reconsideration and withdrawal of the subject rejection is therefore respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

Therefore, in view of the amendments and remarks presented herein, the present case is believed to be in condition for allowance, which action is respectfully requested.

Respectfully submitted,



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Version with markings to show changes made

In the claims

Claim 4 has been amended as follows:

4. The process of claim 3 wherein the monocyclic aromatic hydrocarbon is selected from the group consisting of benzene, toluene, *o*-xylene, *m*-xylene, *p*-xylene, and mixtures thereof.-

TABLE 1: COMPARISON OF ALKYLATION PROCESS

	Gosser's Process (US Patent 4, 255, 343)	Nguyen's / Ragains' Process (Application Docket 0055-IS)
Basic Reaction	Electrophilic Addition of Aromatic Hydrocarbon (Friedel-Crafts Reaction)	Electrophilic Addition of Aromatic Hydrocarbon (Friedel-Crafts Reaction)
Preferred Compound	2-t-Alkylanthracence	Monoalkyl-o-xylene
Application (preferred compound)	Preparation of 2-t-Alkylanthraquinone	Preparation of Monoalkyl-o-xylene Sulfonate
Application (derivative)	Production of hydrogen peroxide	Surfactant for metal working and enhanced oil recovery
Preferred Conditions		
Preferred starting aromatic	Anthracence	o-Xylene
Other starting aromatics	None	Monocyclic Aromatics (one ring)
Preferred alkylating agent	2-methyl-2-butene	1-dodecene
Other alkylating agents	Branched olefins, branched alcohols, branched ether	Linear Olefins
Preferred Temperature	140 - 210°C	80 -130°C
Method of Purification	Fractionation Distillation	None Required
Typical Reaction Mixture Composition		
Unreacted Aromatic, %	42	1 - 2
Unreacted Olefin	?	1 - 2
Monoalkylaromatic	41	> 95
Other Alkyl aromatics	14.2	< 3
Monoalkyl / Other Alkyl Ratio	2.9	> 30

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